

**WHAT IS CLAIMED IS:**

1. An electro-optical composite connector for connecting first and second cables, said first cable incorporating a first power line and a first optical fiber, and said second cable incorporating a second power line and a second optical fiber, said connector comprising:

an electro-optical composite plug having a power connecting device that connects the first power line to supply power, and a first signal converter for converting an optical signal transmitted through the first optical fiber to an electric signal flowing into the second power line and for converting an electric signal transmitted through the second power line to an optical signal flowing into the first optical fiber; and

an electro-optical composite receptacle having a receiver for receiving and releasing said power connecting device, and a second signal converter for converting an optical signal transmitted through the second optical fiber to an electric signal flowing into the first power line and for converting an electric signal transmitted through the first power line to an optical signal flowing into the second optical fiber.

2. The electro-optical composite connector according to claim 1 wherein the first and second signal converters are electrically connected to the first and second power lines; and

wherein, when the electro-optical composite plug and the electro-optical composite receptacle are attached to each other, the electric signal output from any one of the first and second signal converter is transmitted through the power connecting device and the

receiver.

3. The electro-optical composite connector according to claim 1 wherein said power connecting device of the electro-optical composite plug includes a pair of male terminals made of conductive material while said receiver of the electro-optical composite receptacle includes a pair of female terminals made of conductive material;

wherein said first and second signal converters are electrically connected to any one of the male terminal and the female terminal; and

wherein, when the electro-optical composite plug and the electro-optical composite receptacle are connected to each other, the electric signal output from any one of the first and second signal converters is transmitted through the male terminal and the female terminal.

4. An electro-optical composite connector for connecting first and second cables, said first cable incorporating a first power line and a first optical fiber, and said second cable incorporating a second power line and a second optical fiber, said connector comprising:

an electro-optical composite plug having a power connecting device that connects the first power line to supply power, and a first signal converter for converting an optical signal transmitted through the first optical fiber to an optical signal transmitted through space and for converting an optical signal transmitted through space to an optical signal transmitted through the first optical fiber; and

an electro-optical composite receptacle having a receiver for receiving and releasing a power connecting device, and a second signal converter for converting an optical signal transmitted through the second optical fiber to an optical signal transmitted through space and for converting an optical signal transmitted through space to an optical signal transmitted through the second optical fiber.

5. An electro-optical composite cable comprising:

a cable body incorporating a power line and an optical fiber;

an electro-optical composite plug that is connected to an end of the cable body, said plug having a power connecting device that connects said power line to supply power and a first signal converter for converting an optical signal transmitted through the optical fiber to an electric signal flowing into the power line and for converting an electric signal transmitted through the power line to an optical signal flowing into the optical fiber; and

an electro-optical composite receptacle that is connected to the other end of the cable body, said receptacle having a receiver for receiving and releasing a power connecting device, and a second power converter for converting an optical signal transmitted through the optical fiber to an electric signal flowing into the power line and for converting an electric signal transmitted through the power line to an optical signal flowing into the optical fiber.

6. The electro-optical composite cable according to claim 5 wherein the first and second signal converters are electrically connected to the power line; and

wherein the electric signal output from any one of the first and second signal converters is transmitted through the power connecting device and the receiver.

7. The electro-optical composite cable according to claim 5 wherein said power connecting device of the electro-optical composite plug includes a pair of male terminals made of conductive material while said receiver of the electro-optical composite receptacle includes a pair of female terminals made of conductive material;

wherein said first and second signal converters are electrically connected to any one of the male terminal and the female terminal; and

wherein the electric signal output from any one of the first and second signal converters is transmitted through any one of the male terminal and the female terminal.

8. An electro-optical composite cable comprising:

a cable body incorporating a power line and an optical fiber;

an electro-optical composite plug that is connected to an end of the cable body, said plug having a power connecting device that connects the power line to supply power, and a first signal converter for converting an optical signal transmitted through the optical fiber to an optical signal transmitted through space and for converting an optical signal transmitted through space to an optical signal transmitted through the optical fiber; and

an electro-optical composite receptacle that is connected to the other end of the cable body, said receptacle having a receiver for receiving and releasing a power connecting device, and a second signal

converter for converting an optical signal transmitted through the optical fiber to an optical signal transmitted through space and for converting an optical signal transmitted through space to an optical signal transmitted through the optical fiber.

9. A network device for allowing electro-optical composite cable incorporating a power line and an optical fiber to be connected thereto, said network device comprising any one of an electro-optical composite plug and an electro-optical composite receptacle,

wherein said electro-optical composite plug has a power connecting device that connects the power line to supply power, and a first signal converter for converting an optical signal transmitted through the optical fiber to an electric signal and for converting an electric signal transmitted through the power line to an optical signal; and

wherein said electro-optical composite receptacle has a receiver for receiving and releasing the power connecting device and a second signal converter for converting an optical signal transmitted through the optical fiber to an electric signal and for converting an electric signal transmitted through the power line to an optical signal.

10. The network device according to claim 9 wherein said first signal converter is electrically connected to the power line; and

wherein when the electro-optical composite plug contained in the network device and the electro-optical composite receptacle of the cable are connected to each other, the electric signal output from the first signal converter is transmitted through the power connecting

device and the receiver.

11. The network device according to claim 9 wherein said second signal converter is electrically connected to the power line; and wherein when the electro-optical composite plug of the cable and the electro-optical composite receptacle contained in the network device are connected to each other, the electric signal output from the second signal converter is transmitted through the power connecting device and the receiver.

12. The network device according to claim 9 wherein said power connecting device of the electro-optical composite plug includes a pair of male terminals made of conductive material while said receiver of the electro-optical composite receptacle includes a pair of female terminals made of conductive material;

wherein said first signal converter is electrically connected to the male terminal and said second signal converter is electrically connected to the female terminal; and

wherein when the electro-optical composite plug contained in the network device and the electro-optical composite receptacle of the cable are connected to each other, the electric signal output from the first signal converter is transmitted through the male terminal and the female terminal.

13. The network device according to claim 9 wherein said power connecting device of the electro-optical composite plug includes a pair of male terminals made of conductive material while said receiver of the electro-optical composite receptacle includes a pair of female

terminals made of conductive material;

wherein said first signal converter is electrically connected to the male terminal and said second signal converter is electrically connected to the female terminal; and

wherein when the electro-optical composite plug of the cable and the electro-optical composite receptacle contained in the network device are connected to each other, the electric signal output from the second signal converter is transmitted through the male terminal and the female terminal.

14. A network device for allowing electro-optical composite cable incorporating a power line and an optical fiber to be connected thereto, said network device comprising any one of an electro-optical composite plug and an electro-optical composite receptacle,

wherein said electro-optical composite plug has a power connecting device that connects the power line to supply power, and a first signal converter for converting an optical signal transmitted through the optical fiber to an optical signal transmitted through space and for converting an optical signal transmitted through space to an optical signal flowing into the optical fiber; and

wherein said electro-optical composite receptacle has a receiver for receiving and releasing said power connecting device, and a second signal converter for converting an optical signal transmitted through space to an optical signal transmitted through the optical fiber and for converting an optical signal transmitted through the optical fiber to an optical signal transmitted through space.